Weekly Report for 02/03/2014

Highlights

• Preparing APS-U beam physics review. (Aimin Xiao)

APS Renewal and Upgrade

• Preparing APS-U beam physics review with new simulation results. Updated several plots. Have dry runs. (Aimin Xiao)

APS Machine Studies

Storage Ring Studies

• Provided ID28 steering support for Kathy and Jeff's SCU beam loss study. (Aimin Xiao)

• Worked with Marty and Boris on IEX PS and control checkup. (Aimin Xiao)

• Participated in a study with K. Harkay to see how altering ID28 bump, S38 vertical scraper position, and undulator gaps affects the upstream and downstream loss pattern in ID6. Found we could reproduce the US and DS asymmetry by closing just the ID6 gap. (Jeff Dooling)

APS Machine Research and Development

Storage Ring Research and Development

• Attended S37 scraper upgrade meeting. Half-day scraper review is scheduled for February 26th. (Jeff Dooling)

Linac Research and Development

• ASTRA and ELEGANT simulations of the PC gun compressed beam at 20 pC to reduce the energy spread, as compared with previous simulations where peak current and transverse emittances were the major optimization goals. (Yin-e Sun)

ITS Research and Development

• Replaced IR mirrors in the ITS optical injection line with UV mirrors. (Jeff Dooling)

• Measured the IR pulse width using the SSA; again found FWHM values of 2.1-2.2 ps (data and fit). (Jeff Dooling)

• Recorded uv image on ITS input alignment flipper screen. (Jeff Dooling)

• Constructed transverse positioning stage for iris/pinhole uv uniformity control. (Jeff Dooling)

• Attended PCGun/TCAV meeting, discussed readiness for PCGun comissioning in the ITS. (Jeff Dooling)

• Working on laser tranport matrix for the laser room and ITS. (Jeff Dooling)

• Verified the doping of our current laser rod set is 3-percent Nd. We have a number of 4-percent rods without Brewster cut used in the previous incarnation of the regen laser. Since upper state lifetime in the rods is doping dependent, asked S. Edstrom (SLAC) if it made sense to try changing the pump time for the rods to look for an optimum. His response was not to try this yet until he had a chance to review information he has. (Jeff Dooling)

• Using a flash light, tested the PhotoMultiplierTube (PMT) functionality on the scopes with the optical fiber attached to its sensor. Determined 3 locations in the ITS beamline to install phosphor screens for the PMT to aim at. (Yin-e Sun)

• Initiated the work to get the RGA signal available for PC gun conditioning. Obtained a loaner windows PC and installed the RGA software. Tested the software with RGA signals at sector 39. In the process, it was realized that a ion gauge is necessary to get this new model of RGA working and the vacuum group has installed a new cathode gauge on the RF gun waveguide. (Yin-e Sun)

• Contacted R. Wright to change the ITS gun water flow interlock rate from 2 GPM to 3 GPM. (Yin-e Sun)

• Took training from vacuum group and set up the ion pumps vacuum trip point for the PC gun conditioning levels to be 1x10-8Torr. (Yin-e Sun)

• Set up the laser room scope channels with J. Dooling to collect: ICT, Bend line Faraday cup, straight line Faraday cup and PMT signals. (Yin-e Sun)

APS Machine Software

Injectors

• tested booster current ramp correction with CY, sent requests to Shifu for creating pvs to hold the RMS different between current and reference waveforms of booster ramp current waveform. (Hairong Shang)

• added ITS gun waveguide and probe waveform data collection and display to AcquireITSWaveforms. (Hairong Shang)

• changed the correction limit for QD in booster ramp auto correction to avoid correcting too many times and cause unstable. (Hairong Shang)

General

• separate the Acquire ITS/Linac Waveform menu in OAGapps gnome menu, it now is he same as OAGapps application. (Hairong Shang)

• OAGapps gnome menu caused the "out of memory" crashes due to the kbuildsycoca problem because OAGapps gnome tried to merge existing application menu recursively when citrix application is brought up, However, if remove the merge of applications.menu, it will cause the other application menus disappear. Did not find a solution to it yet. (Hairong Shang)

• worked with Hairong to update the RF waveform acquirement tool to collect the waveforms from the cathode half cell, and full cell field probe, and the forward and reflected power of the PC gun waveguide. (Yin-e Sun)

Simulation Software

• implemented reading SDDS file in parallel SVD with parallel SDDS IO, next will work on computing the pseudo inverse from parall svd output matrices (U, Singular, and Vt) with parallel matrix multiplication. Moved parallel svd files to control room cluster (orthros) since weed was busy, setup files and MPI compile on orthros. (Hairong Shang)

• modified SRCorrNoiseModel to work with new data set that one file contains PVs in one IOC, instead of one file for one pv. (Hairong Shang)

IOC/EPICS/Controls/Linux/Solaris/Linux Clusters/Data Loggers/Simulation software

• Checked the PC gun conditioning data logger and added missing PVs in the manual data logger. Send list of missing PVs to Bob Soliday and had them added to the regular linac data logger. (Yin-e Sun)

Publications, papers and report

• Updated the PC gun Commissioning Plan document with modified RF starting points and conditioning procedures. Added health physics survey requirements during the conditioning into the documents. (Yin-e Sun)

Web Site

• Updated the group physics wiki website with Thursday morning Physics group meeting presentation on "PC gun for APS LINAC". (Yin-e Sun)

• Updated the wiki page for Photo-Injector Physics meeting with Wednesday PiP meeting. (Yin-e Sun)

Meetings, workshops, conferences, committees, LMS related, and reviews

• worked on a presentation on the photocathode RF gun for APS LINAC and presented it to the AOG group members on a Thursday group meeting. (Yin-e Sun)

• Organized a Photo-Injector Physics meeting, prepared a presentation to lead the discussions on the review of RF conditioning readiness, and the procedure to follow in order to condition the gun to 12MW, 2.5us and 30 Hz. (Yin-e Sun)

Miscellaneous

• Attended ID29 user meeting discussing their current beamline status. Provided steering support to IEX (ID29) user. At the moment, beam steering at ID29 can only be made by physicists. (Aimin Xiao)